

## The taxonomic and nomenclatural status of the Northern Australian Greater Blue-ringed Octopus (*Hapalochlaena* sp.): a correction with potentially significant consequences

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Australia is a big place and much remains to be discovered about its marine fauna. This is especially true of the invertebrates, which account for about 99% of all species in our seas. Time and again there are instances where a species that was traditionally interpreted as being widespread within Australia and/or the wider Indo-Pacific Ocean is reassessed as a complex of narrow-range endemic species. These reassessments are based on (frequently rather subtle) morphological differences and subsequently validated by genetic studies. Recent examples of molluscs whose status have been reassessed are periwinkles of the genus *Echinolittorina* (Reid 2007), longbums (more generally called mud creepers or mudwhelks) of the genus *Cerithidea* (Reid *et al.* 2008), and nerites of the genus *Nerita* (Spencer *et al.* 2007).

A case in point is that of the blue-ringed octopuses, of which the Northern Australian Greater Blue-ringed Octopus is the subject of this note. The genus *Hapalochlaena* (Cephalopoda: Octopoda: Octopodidae) accommodates those small octopuses which are united by the synapomorphies (unique derived characters) of reduction in size compared to other octopuses, skin pigment arranged as blue circles and/or stripes that become iridescent when an animal is irritated, enlarged salivary glands, and the mantle extended posteriorly into a nipple-like papilla (Norman 2000; Guzik *et al.* 2005). Prior to the turn of the millennium, the taxonomy and nomenclature of the blue-ringed octopuses seemed settled, with just two species recognised: *H. lunulata* (Quoy and Gaimard, 1832) from the Philippines, Indonesia, Melanesia and northern Australia diagnosed by having blue rings confined to its head and mantle, a small ink sac and relatively small eggs (3.5 mm in length); and *H. maculosa* (Hoyle, 1883) widespread from southern Japan to Tasmania diagnosed by having meandering blue stripes in addition to (rarely instead of) rings on the head, mantle and arms, and relatively large eggs (7-8 mm in length) (Nesis 1982). However, it soon became clear to malacologists specialising in the taxonomy of these cephalopods, in particular Tim Stranks and Mark Norman of Museum Victoria, that the situation was far more complex with at least 10 species (at least six being undescribed) separated by different body sizes and the particular arrangements of their blue markings (Norman 2000; M.

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Norman, pers. comm.). Of particular relevance in the Northern Territory is the realisation that the species called *H. lunulata* is in fact two completely different species. True *H. lunulata* from the Philippines, Indonesia and Melanesia is an inhabitant of coral reefs in clear waters, is relatively smaller, has a less muscular body form, and is generally active during the day (diurnal), whereas the second species, which is apparently endemic to the tropical northern coast of Australia, is an inhabitant of silty areas in turbid waters, is relatively larger, has a more muscular body, and is generally nocturnal – thus it is often described as "elusive" (Norman 2000), although it is not that uncommon in favourable habitats (R.C. Willan unpubl.). There are no human fatalities attributed to the former species, whereas the death of a man in Darwin in 1954 is attributed to the latter species (see Jacups & Currie 2008 for details). Preserved specimens of the latter species from the Northern Territory (11 lots ranging from Joseph Bonaparte Gulf to Groote Eylandt) are stored in the wet mollusc collection of the Museum and Art Gallery of the Northern Territory (NTM).

It is crucially important to recognise the taxonomic distinction between these two species and, having realised their status as separate species, then to use the correct scientific names (nomenclature) for each to reflect this distinction. Since the northern Australian species presently has no specific name, it should be called either *Hapalochlaena* sp. 1 (as in Norman 2000; Guzik *et al.* 2005) or *Hapalochlaena* aff. *lunulata* [a technical shorthand way of saying the *Hapalochlaena* species that is similar to, but different from, *H. lunulata*], but the name *Hapalochlaena lunulata* is definitely incorrect.

This species of blue-ringed octopus does in fact already appear in recent technical literature under the name *Hapalochlaena* sp. 1. It appears, albeit rather cryptically, in a paper published in *Molecular Phylogenetics and Evolution*. This paper reports on a specimen from Darwin (stored in Museum Victoria, registration number MV F101643) that was included in a study on the molecular phylogeny of all the benthic shallow-water octopuses (Guzik *et al.* 2005: Figures 2 & 3, Appendix A, line 6).

Establishing the correct taxonomy and nomenclature for the Northern Australian Greater Blue-ringed Octopus is far more than merely semantic because it relates directly to the identification of the octopus that caused the fatality in Darwin in 1954. The actual octopus that bit the man was thrown back into the water, but later his companion produced what he claimed was an "identical" octopus which, although reported as "iridescent blue", was incorrectly identified in the original article in the *Medical Journal of Australia* as *Octopus rugosus*, a much larger species which can cause local allergic effects similar to a bee sting (Flecker & Cotton 1955). The patient was known to be asthmatic and so the possibility of hypersensitivity should not be ruled out. The second octopus was preserved and stored in the mollusc collection at the Australian Museum in Sydney. When re-examined (by a malacologist who did not specialise in cephalopods) 10 years later it was re-identified as a species of *Hapalochlaena* (McMichael 1964), and henceforth this species became synonymous with fatalities from octopus bites in northern Australia.

However, the case should not rest there. It is possible that the offending octopus (i.e., the octopus that caused the fatality in Darwin) was not a blue-ringed octopus at all, even though the second specimen definitely was *Hapalochlaena* sp. 1. Firstly, its size is contentious. Flecker and Cotton (1955) reported it as "6 inches" (approx. 18 cm) long. This size, if correct, is far too large for *Hapalochlaena* sp. 1 which, according to Norman (2000), has a maximum body size of only 6 cm. Secondly, is the fact the specimen was active during the daytime; hence the octopus may have been a different species. So in conclusion, it is just possible that the original specimen is not the species that bit the victim and, as a consequence, the bite of a Northern Australian Greater Blue-ringed Octopus is not fatal to humans after all!

## References

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